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(71) Applicant *(for all designated States except US)*: TELEFONAKTIEBOLAGET LM ERICSSON [SE/SE]; Telefonplan, S-126 25 Stockholm (SE).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: TSOUKAS, George, James [AU/AU]; 1/42 Taylor Street, North Fitzroy, VIC 3068 (AU). McLORINAN, Andrew, George [AU/AU]; 20 Barrett Street, Hampton, VIC 3188 (AU).

(74) Agent: CARTER SMITH & BEADLE; Qantas House, 2 Railway Parade, Camberwell, VIC 3124 (AU).

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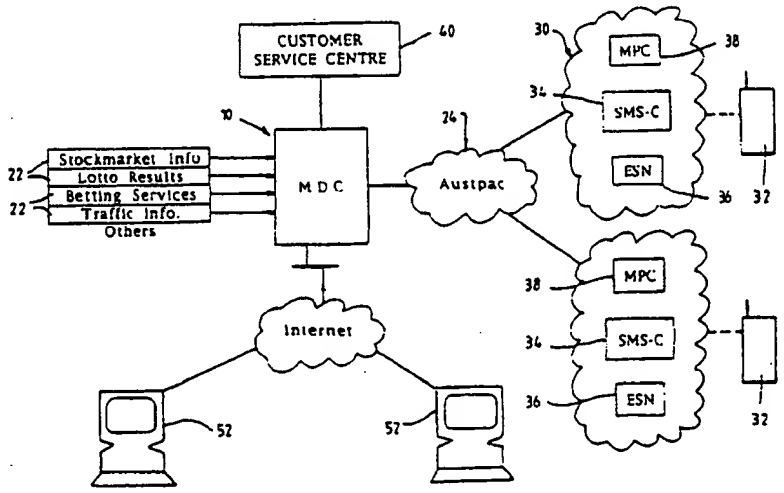

(57) Abstract

A method and system for disseminating information to subscribers of a mobile telecommunications network (30) from at least one information source (20) containing data which is updated continuously or at intervals. The system includes a message distribution centre (10) connected to at least one information source (20) and arranged to process the data to generate information messages for a particular subscriber in accordance with a customer-defined profile of the subscriber, the information messages being transmitted to the subscriber's mobile terminal (32) in the form of short message service (SMS) text messages. The information messages may be transmitted at predetermined times, or upon the occurrence of a predetermined event or may be dependent upon the subscriber's location. A particular subscriber may also request information from the information source (20) at any time, from any location or based on an event and receive the information, as well as the above-mentioned information messages, in a menu-driven format.

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TELECOMMUNICATIONS INFORMATION DISSEMINATION SYSTEM

This invention relates to telecommunications information broadcast services and particularly, but not exclusively, relates to the dissemination of information to subscribers of a mobile telecommunications network.

Various information sources or databases contain data or information which is updated substantially continuously or at regular intervals, for instance stock-market databases, traffic information, sports information and betting services. Such information services, however deliver a continuous feed of information which cannot be tailored to a particular subscriber's requirements.

It is also possible for subscribers of a mobile telecommunications network to use a telecommunications service to access certain information in such databases. These services, however require the subscriber to initiate the delivery of the information, e.g. by a dial-up service.

International Patent Application No. PCT/CA94/00332 discloses a system for transmitting messages to screen-based devices, such as PCs, over a public switched telephone network (PSTN) and using stored program controlled switches (SPCS). A unique connection must be established, through the SPCS, to each screen-based device that is targeted for delivery of the messages. The messages are informational, promotional and/or advertisements that are based on consumer demographics or buying behaviour and are delivered non-intrusively to pre-determined screen-based devices at particular intervals. After viewing a message, a consumer can contact a marketer directly to find out more information or order merchandise in the consumer's locality and the response is recorded as a statistic for the direct marketer. The disclosed system, however, does not provide information to a subscriber based on an event or on the user's location in accordance with the subscriber's profile which is stored and customised by the particular subscriber. Furthermore, real-time information is not provided intrusively to the subscriber based on an information source that is updated continuously.

It is therefore desirable to provide an enhanced telecommunications system for disseminating information to subscribers of the system in which at least some

triggered in accordance with the customer-defined profile of each particular subscriber. The information messages may also be location dependent upon the location of the subscriber's mobile apparatus. For instance, a subscriber may request, in his or her customer profile, for time-dependant information messages, e.g. on particular stocks and shares, stock-market indices or currencies, or traffic alerts affecting a predetermined route, to be sent at predetermined times, e.g. at a certain hour each weekday. Alternatively, or additionally, the subscriber may request to receive event and/or location dependant information messages when a predetermined event occurs, or when the subscriber's mobile apparatus is at a particular location e.g. when a certain stock, index or exchange rate either reaches a certain value or fluctuates by a predetermined percentage or when a traffic alert occurs affecting the subscriber's route at a particular location. It will, however, be appreciated that the present invention is not limited to the dissemination of financial information such as stocks and shares, and may have other applications, for instance in providing betting services and information on sporting events.

The information messages are preferably transmitted via a mobile telecommunications network carrier to subscribers of the mobile network equipped with mobile terminals such as mobile telephones or pagers. The information messages are preferably transmitted in the form of SMS (Short Message Service) text messages. The SMS in a mobile telecommunications network enables a subscriber to receive a text message on a mobile terminal. Hitherto, the SMS facility in mobile terminals has been used to receive paged messages, but subscribers have not been able to receive information messages from information sources containing data which are constructed in accordance with a customer-defined profile of the subscriber.

According to a further aspect of the invention, there is provided apparatus for disseminating information from at least one information source containing data which is updated continuously or at intervals to subscribers of a mobile telecommunications network, comprising service processing means for receiving data from said at least one information source and for accessing a database of stored customer-defined profiles, said service processing means being arranged to

information sources so that a wide variety of information services can be made available for subscribers. The or each service processor is preferably connected to a profile management system which includes or is connected to a customer database containing the customer profiles. The customer database may be maintained separately from the message distribution centre or apparatus containing the service processing means and the message processing means, for instance at a telemarketing centre. The system or apparatus may also include means for connecting the message distribution centre and/or the customer database to the Internet, for instance a World Wide Web Server, so that a subscriber can enter or change details of his or her customer profile via the Internet.

According to a further aspect of the invention there is provided a system for disseminating information from at least one information source containing data to subscribers of a mobile telecommunications network, comprising:

location determining means for determining the location of mobile terminals of particular subscribers of the network;

a message distribution centre connected to or including at least one information source containing data, wherein the message distribution centre includes service processing means for receiving and processing data from said at least one information source to generate location-dependent messages for particular subscribers in accordance with the location of the particular subscribers; and

message processing means for transmitting the information messages to the subscribers.

In the various aspects of the invention, information messages may be transmitted in response to requests from particular subscribers on information from said at least one information source, the request being initiated at any time, from any location or based on any event.

For instance, messages may be transmitted in response to a request from a particular subscriber for information associated with his/her location at the time the request is made.

The system or apparatus may deliver the event-dependent, location-dependent and/or time dependent messages to the subscriber in a menu driven format. The

for instance by a dedicated leased telephone line PPP DXL, to a telemarketing centre 40 which provides customer and service administration, including the handling of charging and billing records, customer registration and enquires, and customer requests to change their individual customer profiles. The system may also include a World Wide Web (WWW) server 50 allowing subscribers provided with personal computers (PCs) 52 to interact with the message distribution centre 10 via the Internet. This allows subscribers to perform such activities as on-line registration and service selection, customer profile administration, billing and service enquires and ad-hoc message transmission.

Each telecommunications network 30 has a USSD facilitating node 36 which is an interface that facilitates dialogue and the transmission of Unstructured Supplmentary Services Data (USSD) between a subscriber of that particular network and the message distribution centre 10. One type of USSD facilitating node which may be used in the present invention is Ericsson's Enhanced Services Node (ESN). The node 36 enables messages to be sent and received between the MDC and the subscriber and enables menus to be received by the subscriber. The subscriber can respond by selecting one or more options from the menus depending on the circumstances of the subscriber or in accordance with the subscriber profile. The menus are generated by Unstructured Supplementary Services Data (USSD) so that a particular service, as processed by one of the service processors 12, provides the subscriber with a menu structure that is controlled by the subscriber. The USSD utilises the control channel in GSM networks. Each node 36 is linked to a USSD interface or gateway 44 in the MDC 10 which communicates with each of the service processors 12 and profile management system 14. By way of example, a subscriber wishing to know information about a stock will be presented with a menu giving options to find out more information on that stock. Menus can also be downloaded in situations that are location dependent. A mobile terminal locating means, such as Ericsson's Mobile Positioning Centre (MPC) 38, is located in each of the telecommunications networks 30 for determining the location of a subscriber's mobile terminal within the network on a geographic basis. Each MPC is linked to a location processor 46 in MDC 10.

Alternatively, the system offers the subscriber "go to" services wherein the subscriber can request information at any time whilst travelling, for example, on the above-described route. These services are enabled through the USSD facilitating node 36 and the USSD gateway 44. The information requested by the subscriber and subsequently transmitted to the subscriber is not limited to traffic information but can be from many other databases/sources as previously mentioned. For example, information services that may be requested include:-

(1) emergencies:- If a subscriber's vehicle has broken down, roadside assistance can be requested wherein the location of the subscriber's vehicle is stored in the relevant service processor and in return, information relating to the position of the nearest available roadside assistant is transmitted to the subscriber. Position requests may also be made in relation to the nearest police vehicle/station, ambulance and towing operators.

(2) food service guides:- Based on the location of the subscriber, he or she may request information on the location of nearby restaurants, take-away venues, etc.

(3) tourism/amusements:- Again, based on the location of the subscriber, if there are particular tourist attractions or amusements nearby, then the location of these or the times that they are open/showing may be transmitted to the subscriber's terminal or called on by request from the subscriber who can go through a series of menus on a particular attraction or amusement.

(4) public transport:- Requesting information on taxi services, or booking a taxi, information relating to train and tram timetables for a nearby station/stop or for particular destinations for which train/tram is most feasible to take can be requested or downloaded. Furthermore, information on aircraft such as arrival/departure times and flight numbers of airlines can be requested.

(5) petrol/amenities:- The nearest location of petrol stations, fast food outlets, hotels, pubs, etc can be requested.

Any of the above services can offer the telephone number of the particular item of interest requested by the subscriber, wherein the subscriber is connected through to the requested item and dialogue can take place between the subscriber

messages in accordance with the customer profiles of the subscribers. The message distribution centre 10 may also include monitoring means in the form of an alarm monitor 16 for monitoring the performance of the service processors 12, the message processors 13 and the profile management system 14, and for generating audible and/or visual alarm signals when a malfunction occurs.

The operation of the system to produce time-dependant and event-dependant messages will now be described, by way of example only, in connection with a stock market and financial information broadcast service, which is one use of the system. The system will receive a data feed directly from a commercial stock market and financial information source, such as the "DF2" data feed signal provided in Australia by AAP Information Services Pty Ltd (AAP). The DF2 signal contains a large quantity of diverse information which is updated substantially continuously or at regular intervals, including stocks, indices, interest rates, currencies and company news. The information broadcast service will preferably be available to subscribers of a plurality of mobile telecommunications network carriers. In Australia there are currently three main mobile network carriers, Telstra, Optus and Vodafone, each of which use GSM (Global System for Mobile) digital mobile telephone, an Internationally recognised standard digital telephone system which provides a Short Message Service (SMS) facility. Any subscriber of one of the SMS carriers and having the facility to receive SMS text messages on his or her mobile terminal may apply to become a customer of the information broadcast service via the telemarketing centre, or alternatively via the Internet and the World Wide Web Server 50. The telemarketing centre, including the customer database, is set up to manage, maintain and administer customer information, including contact details, billing details and customer specific stock market information selections and related notification and trigger events. Customer administration and service connections, alterations and disconnections may be performed through a front end, PC-based system.

It is envisaged that a range of services will be available to customers, including: Individual stock prices; Indices; Interest Rates; and Currencies.

In order to offer a "personalised" service, each customer's record may have

particular stock as indicated by 118. If the customer has not requested information on a stock no message is generated for that stock as indicated by 120. The clock 15 continuously sends real time signals to the service processor (as indicated by 115) and if the customer has requested information on a particular stock, the customer request time (e.g. 9am each weekday) is compared with the real time signal as indicated by 122 to determine whether it is time to send an information message to the customer as indicated by 124. No message is sent (as indicated by 126) until it is time to send a message and then the service processor 12 passes the message to the appropriate message processor 13 for the customer's carrier network as indicated by 128. The message processor then processes the message into the appropriate SMS form for the customer's carrier network and sends the message to the SMS centre 34 as indicated by 130.

(b) percentage change ("event dependant" reporting)

For these stocks, a customer may request to receive event-dependant messages by providing a percentage fluctuation amount (positive and/or negative) from a previous quote. This will act as the trigger or event which will spawn a message to be delivered. The customer may also request exclusion times, days, etc as for service (a) above.

Examples

- "Please notify me when MIM stocks fluctuate by +/- 20% starting from 9am and finishing at 4pm and only on weekdays
- "Please notify me when MIM stocks fluctuate by -20% starting from 9am and finishing at 2pm and only on weekends"

The way in which event-dependant messages may be processed will now be described with reference to the flowchart of Figure 4. The service processor 12 connected to the AAP information source continuously receives data from the source as indicated by 210. The service processor stores the current data and previous data as indicated by 212 and receives time signals from the real time clock

- "Please notify me of the Dow Jones index at 2 hourly intervals starting at 9am and finishing at 4pm each weekday"

(b) event dependant

- "Please notify me when the Dow Jones index fluctuates by more than +/- 20% from the last quote from 9am and finishing at 5pm on weekdays"

Such time dependant and event dependant messages may be processed by the message distribution centre in similar manner to the individual stock information messages 1(a) and 1(b) above as described with reference to Figures 3 and 4.

3. Interest Rates

An interest rate delivery service may also be provided to deliver nominated interest rates to customers using either predetermined delivery times/intervals or event dependant delivery triggers (as for the services 1 and 2 above)

Examples

- "Please send me information regarding interest rate 'x' when it fluxuates by 17% on weekdays starting at 10am and finishing at 3pm".

3. Currencies

A currency delivery service may also be provided to deliver nominated currency figures to customers using either predefined delivery times/intervals or event dependant delivery triggers (as for the services 1 and 2 above)

Examples

- "Please send me information regarding the current value of the US Dollar at half hourly intervals on weekdays starting at 11am and finishing at 4pm"

Claims

1. A method of disseminating information from at least one information source containing data which is updated continuously or at intervals to subscribers of a telecommunications network comprising the steps of:

storing customer-defined profiles of subscribers of the network;

receiving, at a message distribution centre, data from said information source which is updated continuously or at intervals;

processing said data to produce information messages for particular subscribers in accordance with a stored customer-defined profile of each subscriber;

transmitting said information messages to particular subscribers in accordance with the stored customer-defined profile of each subscriber.

2. A method according to claim 1 wherein the information messages are transmitted to a particular subscriber at predetermined times or intervals of time in accordance with the customer-defined profile of said particular subscriber.

3. A method according to claim 1 wherein the information messages are transmitted to a particular subscriber upon the occurrence of predetermined events which are triggered in accordance with the customer-defined profile of said particular subscriber.

4. A method according to claim 1 wherein the information messages are transmitted to a particular subscriber dependent upon the location of said particular subscriber in accordance with the customer-defined profile of said particular subscriber.

5. A method according to any one of the preceding claims wherein the information messages are transmitted in a menu-driven format in accordance with the customer-defined profile of a particular subscriber.

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12. A system according to claim 10 wherein the system includes event-processing means and the information messages are transmitted to particular subscribers upon the occurrence of predetermined events which are triggered in accordance with the customer-defined profile of each particular subscriber.

13. A system according to claim 10 wherein the system includes location processing means and the information messages are transmitted to a particular subscriber dependent upon the location of said particular subscriber in accordance with the customer-defined profile of said particular subscriber.

14. A system according to any one of claims 10 to 13 wherein the service processing means includes menu-generating means for producing information messages in a menu-driven format for transmission to subscribers of the network.

15. A system according to claim 10 wherein the information messages are transmitted in response to a request from a particular subscriber on information from said at least one information source, the request being initiated at any time, from any location or based on an event.

16. A system according to any one of claims 10 to 15 wherein the information messages are transmitted via a mobile telecommunications network carrier to subscribers of the network equipped with mobile terminals.

17. A system according to claim 16 wherein the information messages are transmitted in the form of short message service (SMS) text messages from the message processing means to a subscriber's terminal via a short message service centre (SMS-C).

18. A system according to claim 16 or claim 17 wherein the system includes mobile positioning means for determining the location of a subscriber's terminal, said mobile positioning means transmitting the location of a subscriber's terminal

times or intervals of time in accordance with the customer-defined profile of each particular subscriber.

24. Apparatus according to claim 22 wherein the service processing means is arranged to generate event-dependent information messages for transmission to particular subscribers upon the occurrence of predetermined events which are triggered in accordance with the customer-defined profile of each particular subscriber.

25. Apparatus according to claim 22 wherein the apparatus includes location processing means for processing location signals representing the location of particular subscribers and the service processing means is arranged to generate location dependent information messages for transmission to particular subscribers in accordance with the customer-defined profile of each particular subscriber.

26. Apparatus according to any one of claims 22 to 25 wherein the apparatus includes an interface for receiving requests from subscribers and the service processing means is arranged to generate information messages for transmission in response to a request from a particular subscriber on information from said at least one information source.

27. Apparatus according to any one of claims 22 to 26 wherein the service processing means includes menu-generating means for generating information messages in a menu-driven format.

28. Apparatus according to any one of claims 22 to 27 wherein said service processing means comprises a plurality of service processors to receive data from a corresponding number of information sources.

29. Apparatus according to any one of claims 22 to 28 wherein the or each service processor is connected to a profile management system which includes or

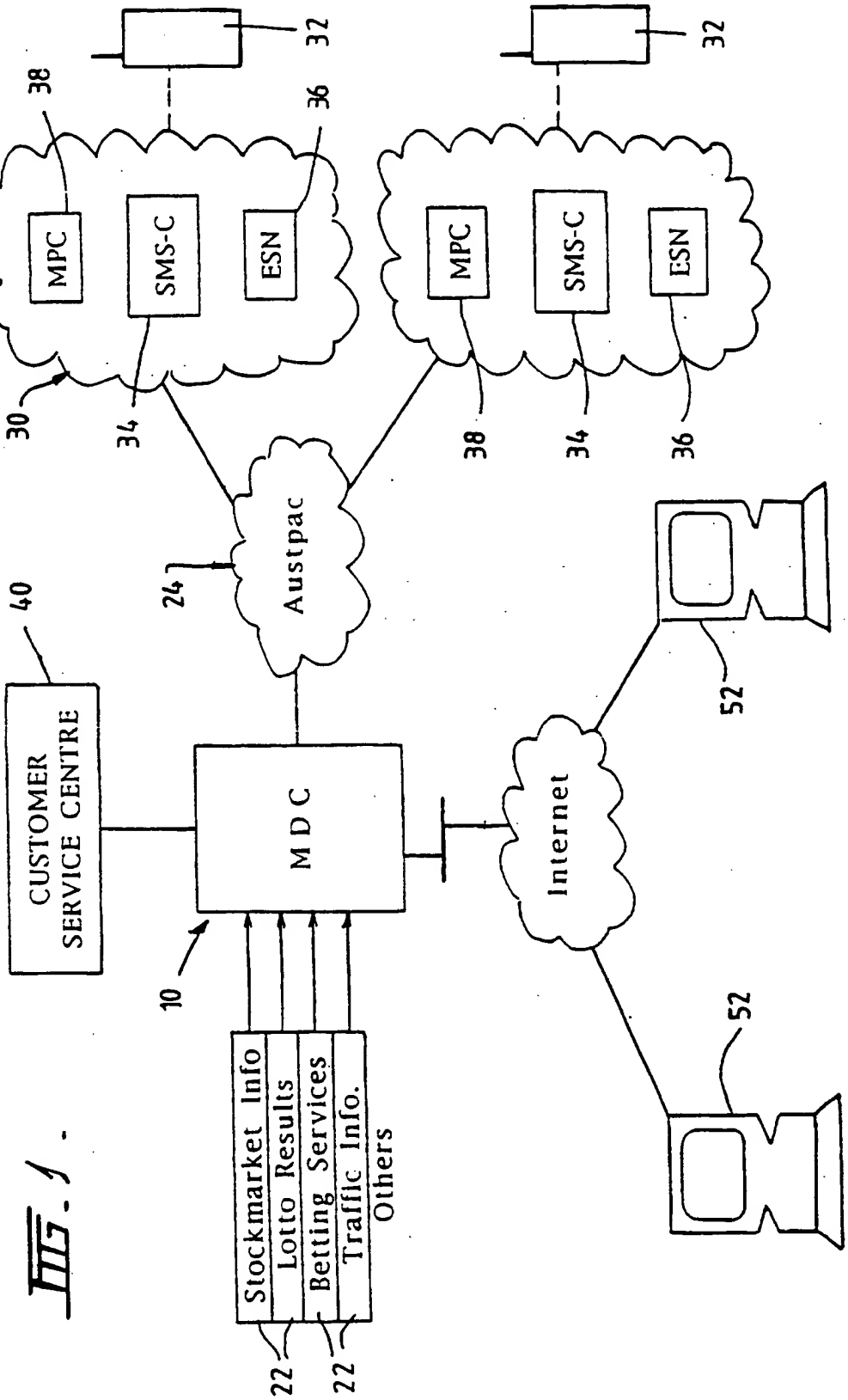

FIG. 1.

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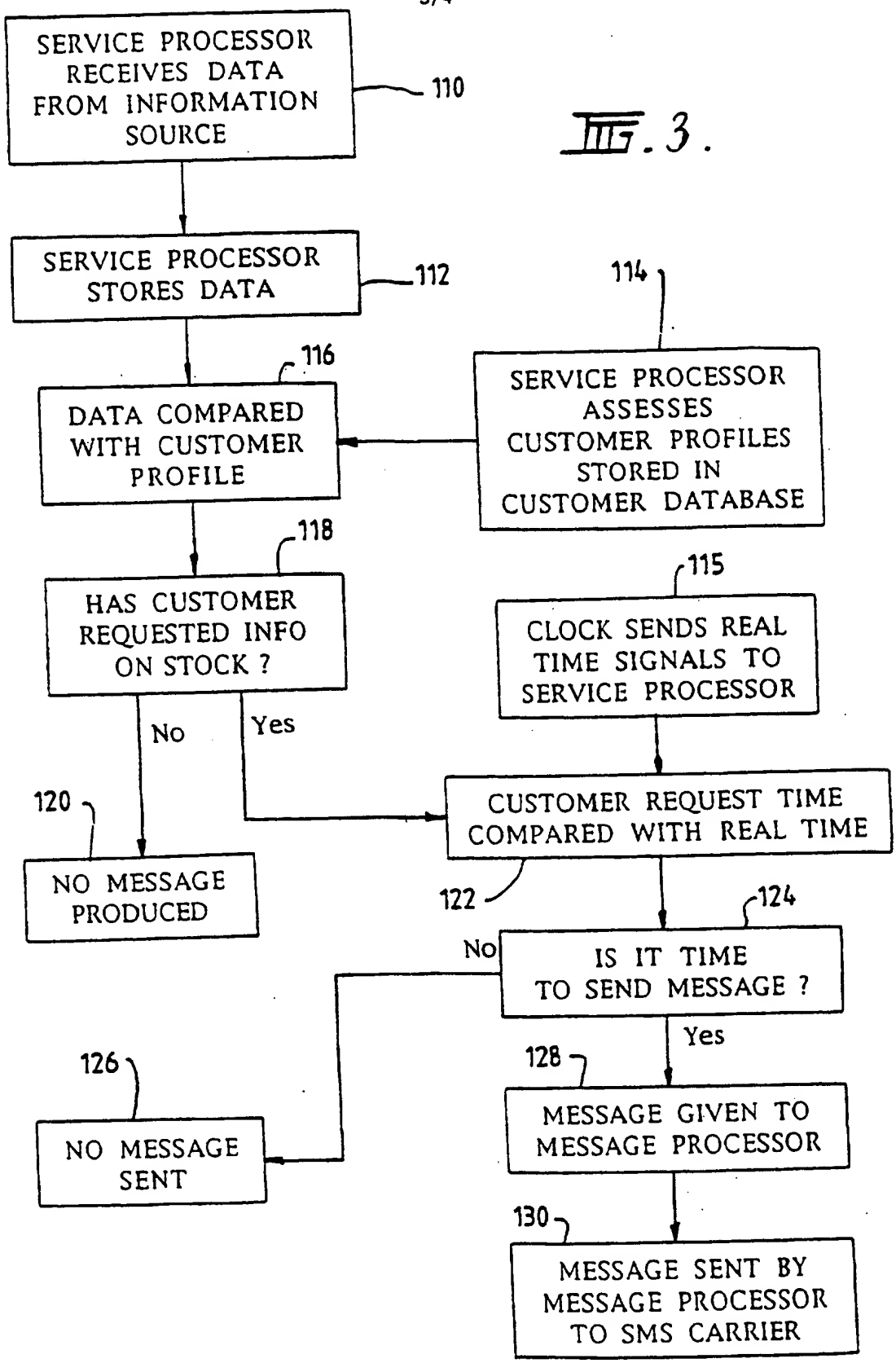

FIG. 3.

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INTERNATIONAL SEARCH REPORT

International Application No.
PCT/AU 97/00260

A. CLASSIFICATION OF SUBJECT MATTER

Int Cl[6]: H04H 1/00, 1/08, H04L 12/16, 12/18, H04Q 7/20, H04B 7/26

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC : H04H 1/00, 1/08, H04L 12/16, 12/18, H04M 3/42, 11/08, H04Q 3/64, 7/20, H04B 7/26

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
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Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 94/30000 A (NEW BRUNSWICK TELEPHONE COMPANY LIMITED) 22 December 1994 Page 11 line 33 - page 20 line 15	1-7, 10-15, 19, 20
X	AU 81845/94 A (AT & T CORP) 13 July 1995 Figure 6, page 6 line 29 - Page 7 line 27, page 10 lines 11-31, the abstract	1, 10
P,X	DE 4440419 A (T. ISSING et al.) 9 May 1996 Column 3 line 5 - column 4 line 7, column 6 lines 30-51	1, 6, 10, 15

☐ Further documents are listed in the continuation of Box C

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